

present little book 'In Bird-land,' by Mr. Pike, may well rank beside the best in this direction. The birds and their ways are for the most part feelingly described, and the author shows himself to be not only an observer but also a lover of nature. We are at one with him in his condemnation of the gamekeeper. The fauna of these Islands has suffered great and irreparable losses at his ignorant hands. But if the keeper is to be subjected to the lash of our displeasure, how much more so shall his employer, who signs the death-warrants which he executes?

Many of the illustrations of this book are excellent. Some are bad. The frontispiece forces a grumble from us. It is really beautiful, and it seems a pity that, since such work is possible, some of the inferior or less interesting pictures were not suppressed, and the remainder reproduced in the same way as the frontispiece. What was lost in quantity would be repaid a hundredfold in quality.

There is some excuse for the use of photography in reproducing actual outdoor scenes, or objects of natural history taken at first hand, but to call in its aid to reproduce bad drawings is indeed a sin. The illustrations to the 'Birds of Eastern North America' is a case in point. The figures in this work are for the most part grotesque; they could scarcely be worse.

As a "key" the book is doubtless useful. The terms, however, employed in describing the topography of a bird are often faulty, sometimes very much so. We must protest against the use of the word "tertials" to indicate the long inner secondaries of the wing. On page 3 "tertials" are defined as "the few remaining remiges which grow from the humerus." The feathers called "tertials" in the plates are only long inner secondaries: it is very doubtful whether the parapteron and hypopteron can legitimately be regarded as remiges.

With a little pruning and revising this book could be made worthy of its author.

*A Natural History of the British Lepidoptera. A Textbook for Students and Collectors.* By J. W. Tutt, F.E.S. Vol. II. London: Swan Sonnenschein & Co., May 1900. Pp. viii, 584; plates vii.

THE first volume of Mr. Tutt's great work on British Lepidoptera appeared in January 1899, and already the second volume is lying before us. We are glad to find that the author has received so much encouragement that he is enabled to proceed with the book without delay and in the most elaborate manner. The second volume is thicker than the first by no less than 24 pages, and is similarly divided into two parts. The first part

is divided into five chapters, of which the first two deal with metamorphosis in Lepidoptera, and the others with the external morphology, internal structure, and phylogeny of the Lepidopterous pupa. The second part includes the Psychides (divided into Micropsychina and Macropsychina), a catalogue of the Palearctic Psychides, the first portion of the Lachneides, and Index. The author has not only epitomized a large part of the extensive literature relating to the various subjects of which he treats, but has added a very large amount of entirely new and original matter, derived from the observations of himself and his correspondents.

No less than 334 pages of the second volume are devoted to the interesting, but extremely difficult, group of the Psychides, which is one of the most remarkable among the Lepidoptera. The females are almost always apterous, and in some species are almost destitute of legs and antennae as well, being thus reduced to the condition of mere helpless egg-bags. The larvæ form cases for themselves on the plants on which they feed, somewhat resembling those formed by the larvæ of caddis-flies (*Trichoptera*), to which some entomologists have considered the Psychidæ to be allied. Here the pupa is formed, and the more helpless females never quit it, but deposit their eggs within it. Another peculiarity is that parthenogenesis is so common in some of the species, especially in the genus *Solenobia*, that you may go on breeding from the larva-like female for generation after generation without ever seeing a male, which greatly adds to the difficulty of satisfactorily separating and defining the species.

Mr. Tutt has thoroughly reviewed this difficult group. His Catalogue of the Palearctic Psychides includes no less than 11 families, 20 subfamilies, 36 genera (of which 8 are new), and 143 species, besides varieties, &c. Among the Psychidæ, Mr. Tutt places several genera which many previous authors have included in the Tineides, such as *Diplodoma*, *Lyprusa*, *Melasina*, *Solenobia*, *Talaporia*, &c. But if we exclude these, we find that the Psychides proper, which a few years ago used to form a single family, of three genera at most, and which were often included in one, has now expanded to four families, comprising twelve sections, and twenty-seven genera! This will appear to old-fashioned entomologists a terrible and unnecessary amount of subdivision, but in most similar cases the foresight of the innovator is, sooner or later, largely justified by the judgment of his successors.

The natural history of each species is also worked out as exhaustively as before; thus the account of *Pachythelia villosella*, Ochs., occupies more than eighteen closely printed pages.

The reprint of the original description of each genus and species, whether short or long, is a great assistance, especially as the original types of the genera are clearly indicated. Had this always been done, we should have been spared a tremendous amount of confusion, though few cases are quite so glaring as that of the genus

*Ecophora*, to which we may here allude, though it does not belong to the families that have yet been discussed by Mr. Tutt. Latreille established the genus *Ecophora* for *Æ. sulphurella*, Linné, which remained the type for twenty years, Curtis actually figuring it as such, and Stephens sinking his own genus *Dasycera* as a synonym. But Zeller gave the genus a wider extension, dividing it into three sections, for the last of which he adopted Stephens's discarded name of *Dasycera*. Then Stainton adopted *Ecophora* for Zeller's first section, separating *sulphurella* (the inalienable type of *Ecophora*) as *Dasycera*. Then Mr. Meyrick established two families, Ecophoridae and Dasyceridae, thus turning the very type of *Ecophora* out of the family (Ecophoridae itself! This has since been rectified, but it is only an illustration of many similar cases which will occur to any entomologist who troubles himself about synonymy.

The remainder of the present volume is devoted to a portion of the Lachneides (or Lasiocampides), and the classifications of Hübner, Aurivillius, Dyar, and others are quoted in full. Only five species, however, are dealt with in the present volume: *Pæcilocampa populi*, *Trichiura cratægi*, *Lachneis lanestris*, and *Malacosoma castrensis* and *M. neustria*. Mr. Tutt estimates that the remaining five genera and six species of the superfamily Lachneides will occupy 200 pages of the next volume. In his remarks on the phylogeny of the Lachneides, we are pleased to see that while freely expressing his own views, and criticizing those of his predecessors, he puts them forward tentatively, and quite avoids the dogmatic tone assumed by certain writers on what must necessarily long remain one of the most difficult and uncertain problems in entomology—all the more so, because, in Lepidoptera at least, we have nothing but the barest fragments of any Geological Record to help us to verify any of our conclusions; and without this we are necessarily only groping in the dark.

Five of the seven plates in the present volume are devoted to Psychides—phylogeny, neurulation, spurs, antennæ; imagines and cases of *Whittleia retiella*; and the transformations of the American *Thyridopteryx ephemeraformis*. Plate 1 is devoted to the wings, wing-scales, &c. of Lepidoptera, and plate 7 to Dyar's phylogeny of the Lachneides.

We can fully sympathize with what Mr. Tutt says in his preface about the difficulty of getting more matter into each volume, but yet we should like to suggest that it would be very useful to include in the Contents a list of the British genera and species discussed in each volume. As the number of these is very limited, this would require very little space, and would probably not involve the sacrifice of more than a single page.

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